

# WSPR & Raspberry Pi

Create a WSPR Transmitter using a  
Raspberry Pi Computer

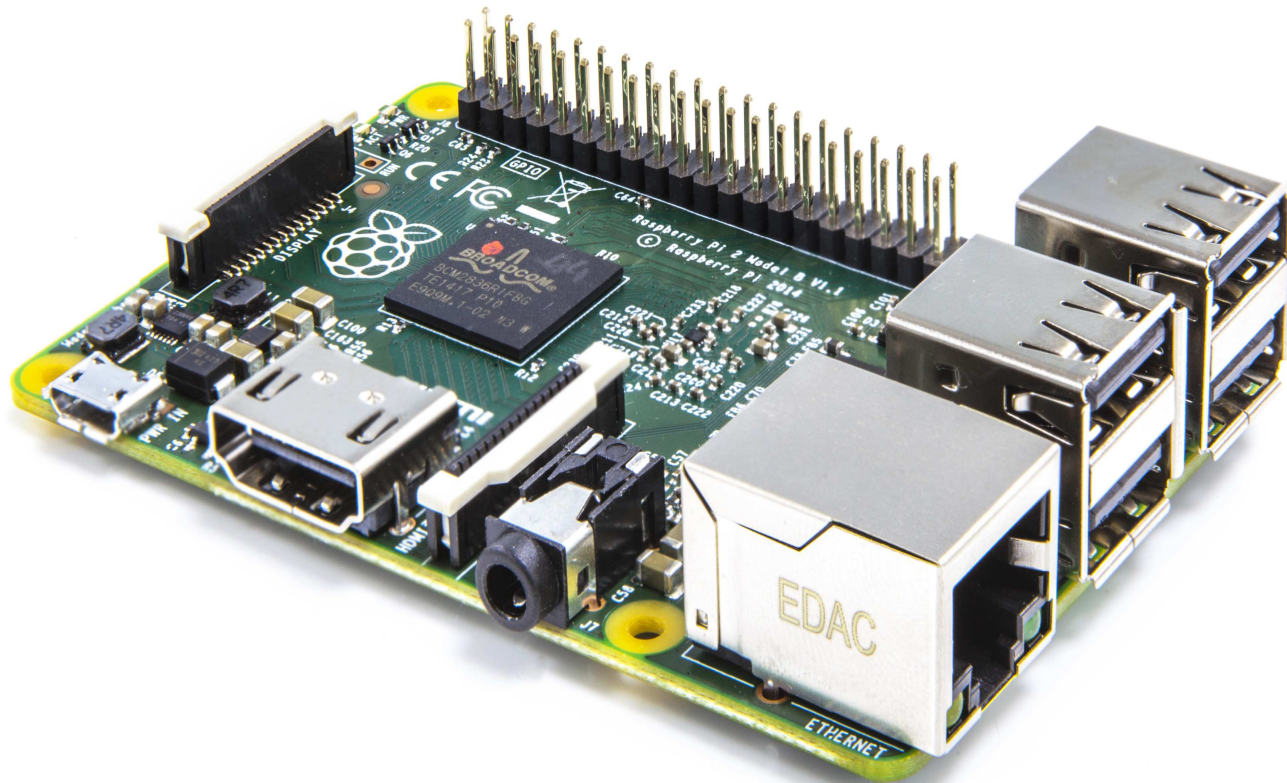
# WSPR Transmitter

- WSPR => Weak Signal Propagation Reporter
- WSPR is a digital mode
- Beacon: transmit and see who hears you
- WSPR receivers spread around the world, add sitings to database on Internet

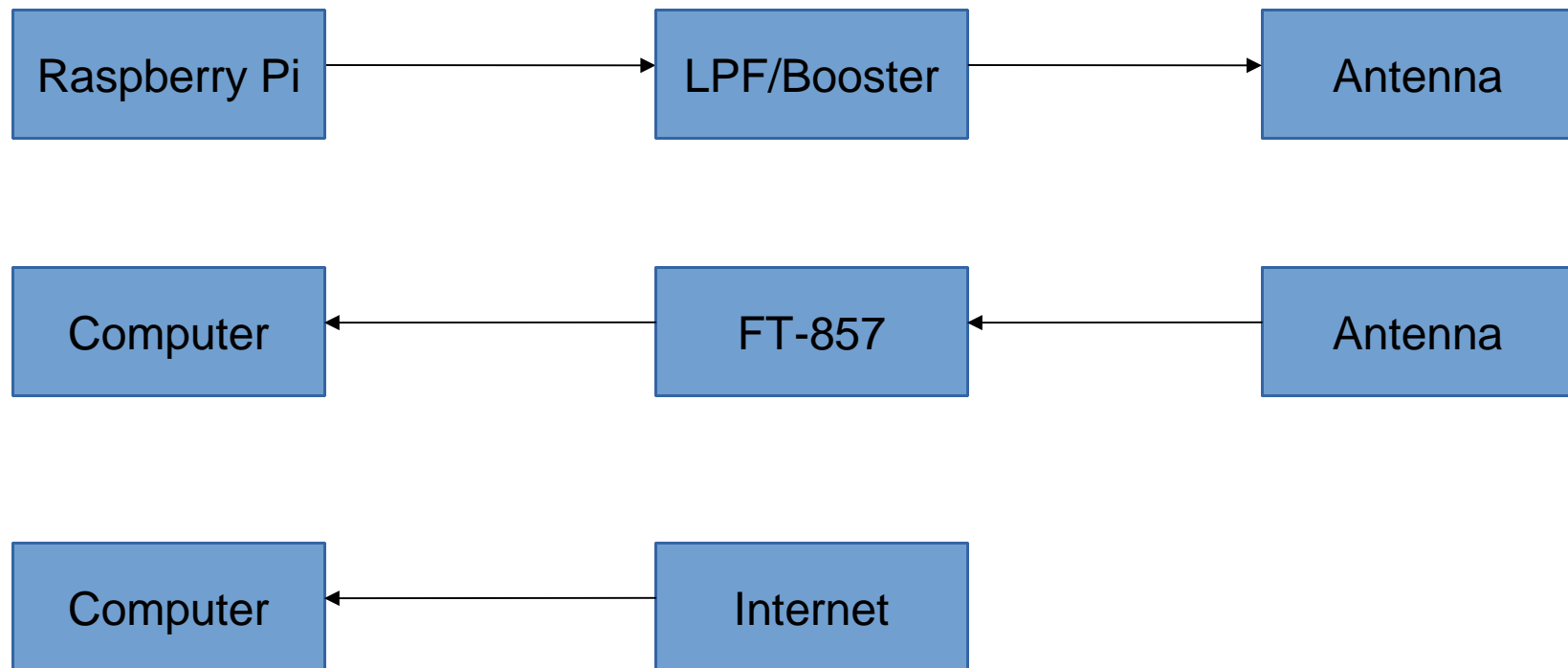
# WSPR Details

- Narrow bandwidth and accurate timing – low power (my transmitter: 32 mW) – cost: accurate frequency and timing
- Equivalent power: WSPR (1.5 Hz BW): 32 mW, PSK31 (31 Hz): 0.66 W, SSB (3KHz): 64 W
- WSPR message: call sign, grid square, power level; 55 bits; takes 2 minutes to transmit
- WSPR program runs on Raspberry Pi
- Gets timing data from NTP servers on Internet

# Raspberry Pi



# Station Layout



# Low Pass Filter & Booster

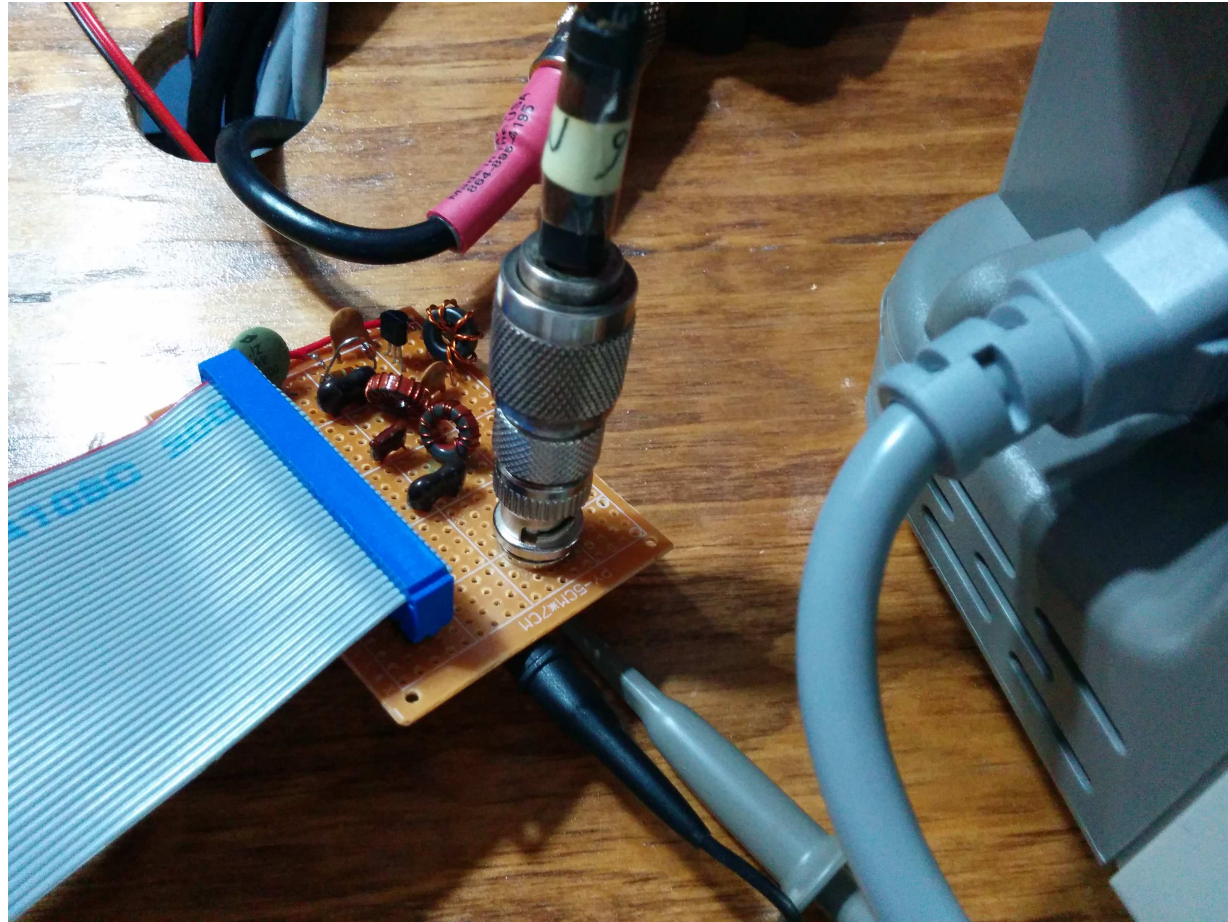
- Raspberry Pi outputs square wave – needs to be filtered
- Low pass filter to only pass fundamental
- Booster to raise 10 mW from Raspberry Pi to 32 mW

# Raspberry Pi Connected to LPF



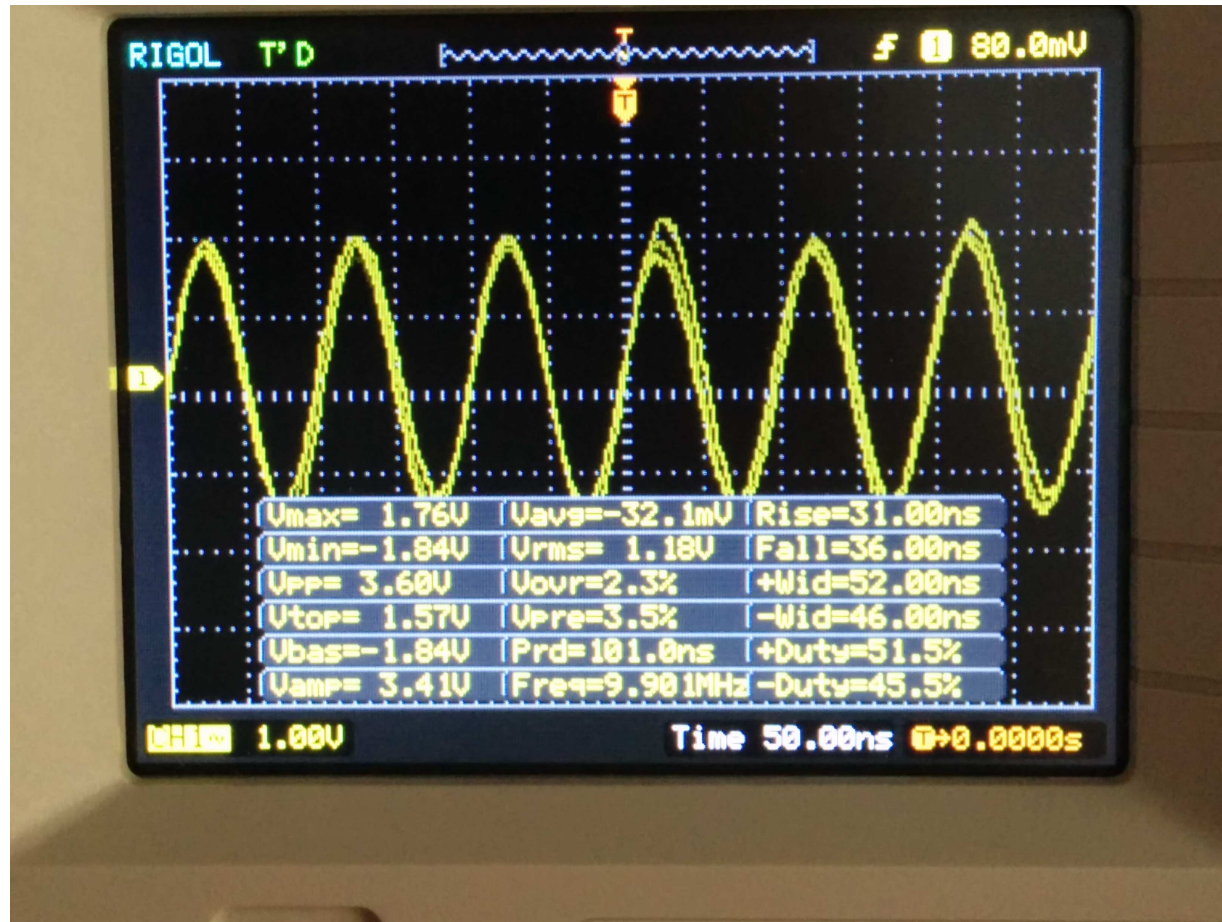


# LPF & Booster Amp

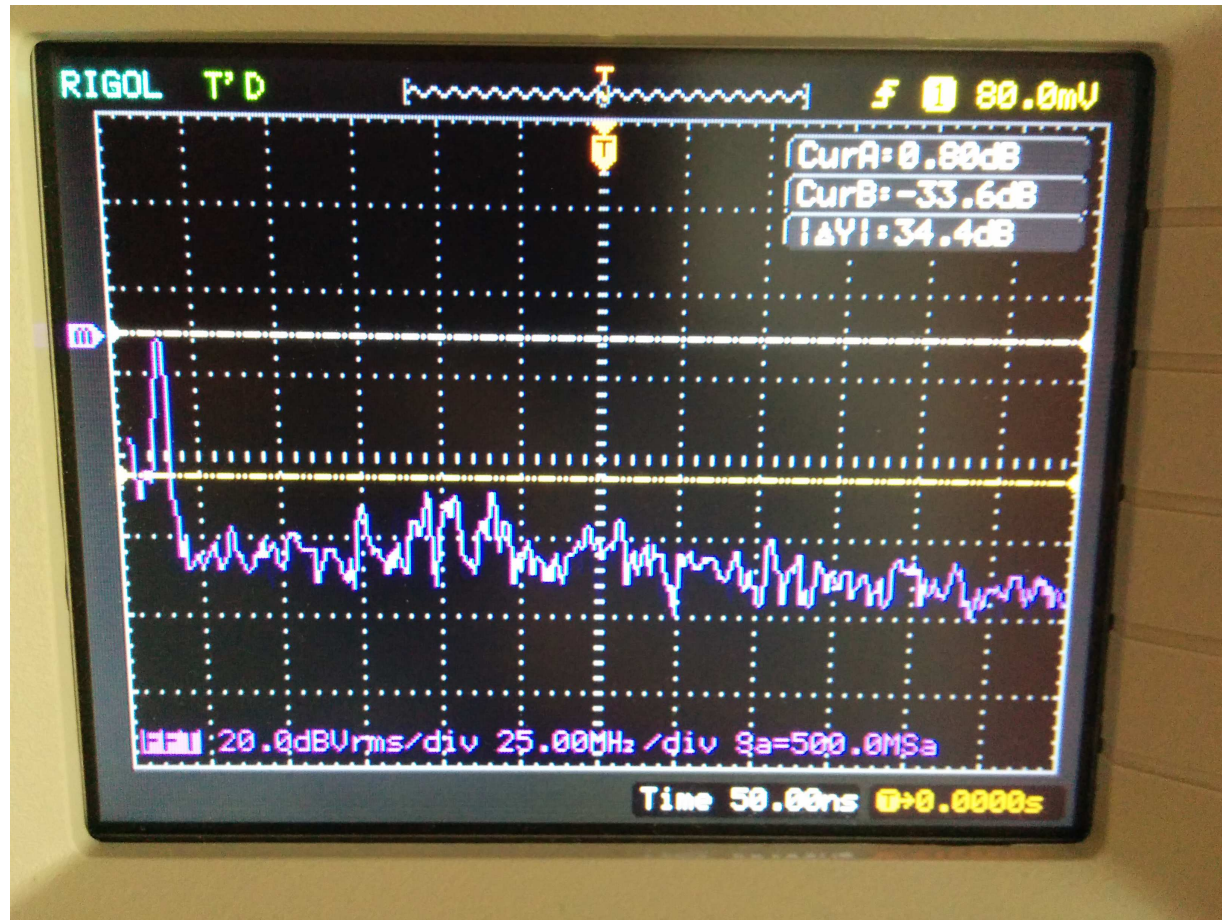




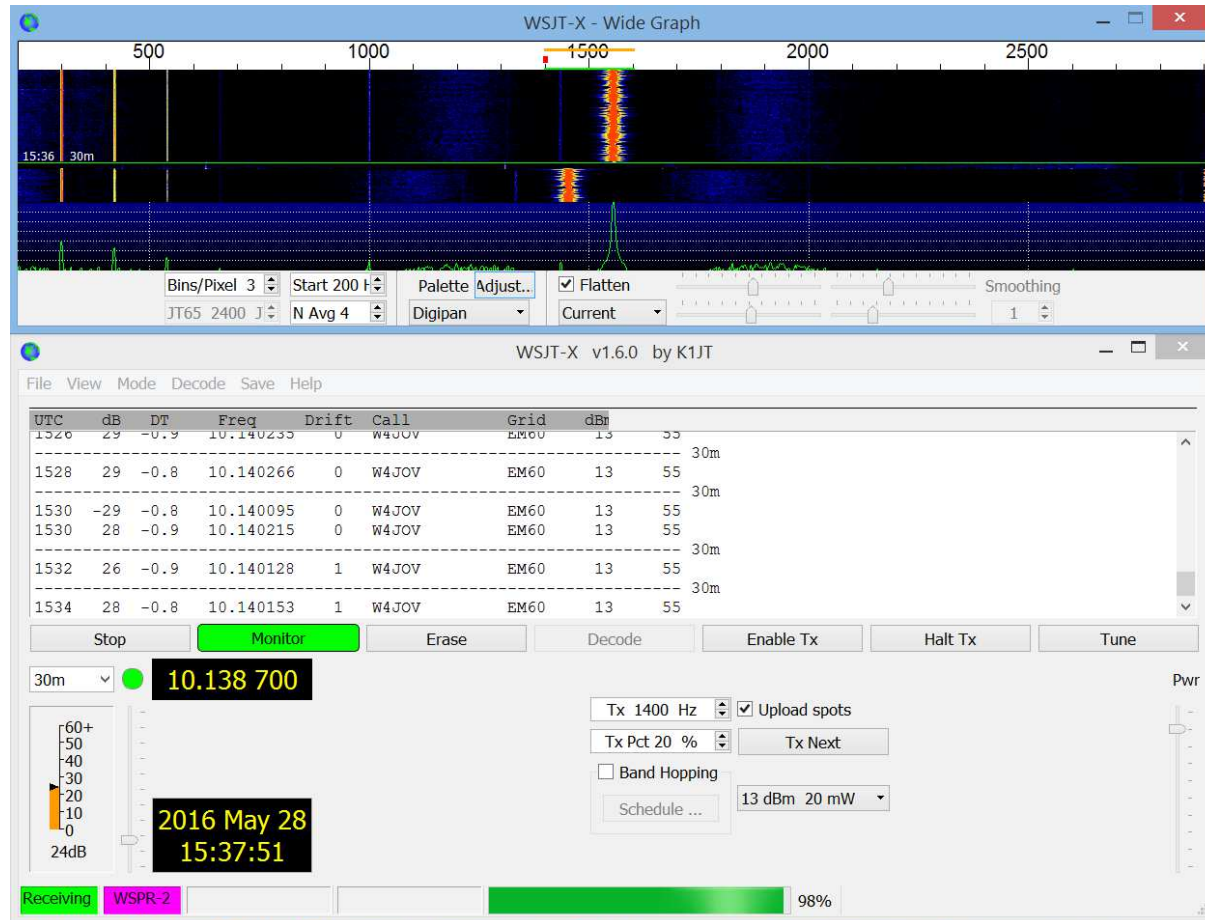
# 'Scope Trace



# Spectrum

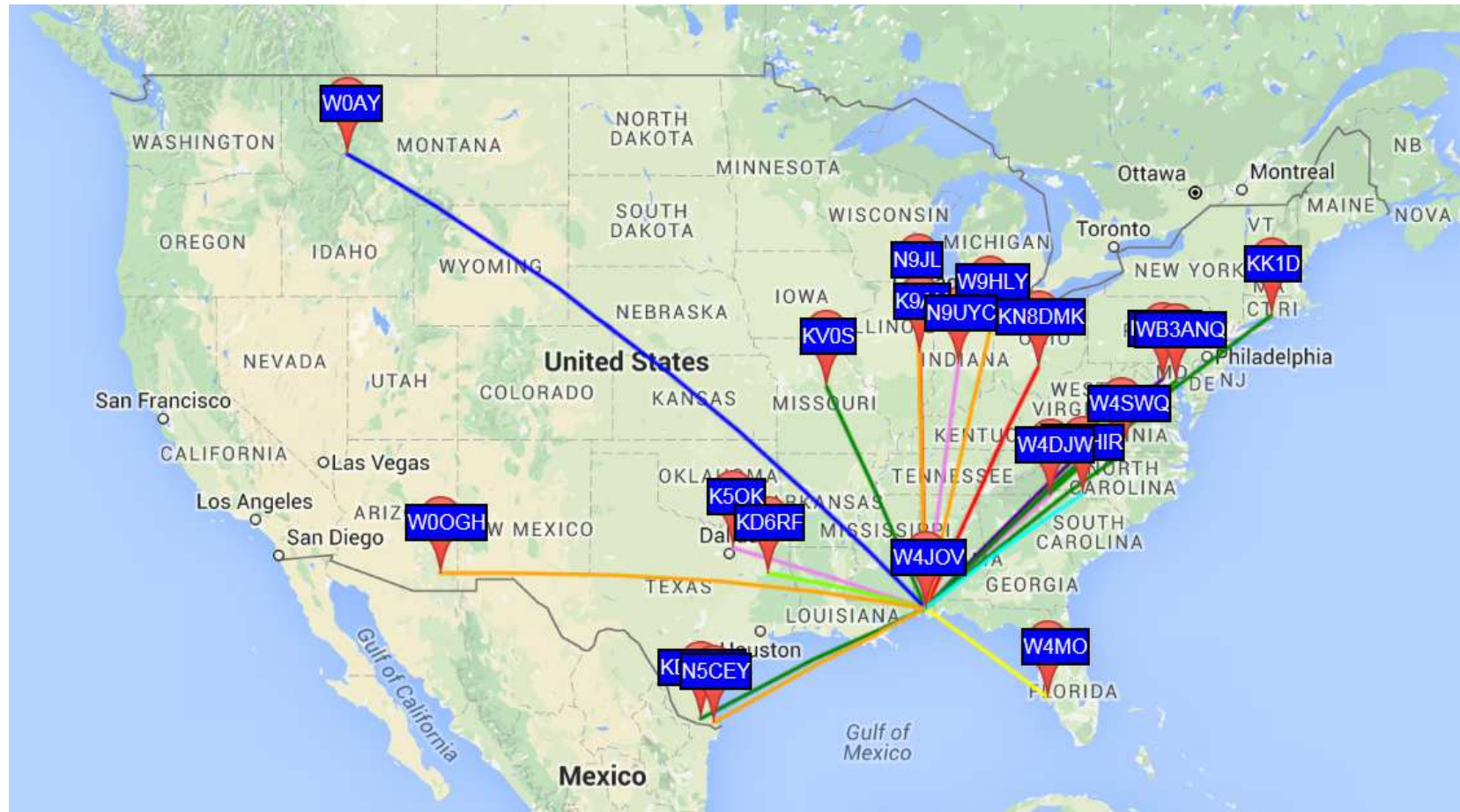


# WSPR-X Monitoring





# Contacts Made With 32 mW



# Update

- Subsequently, output power was raised from 32 mW (15 dBm) to 200 mW (23 dBm)
- Signal was heard in Australia and New Zealand

# Summary

- Created WSPR (digital mode) beacon
- Total cost < \$50
- Heard in Australia and New Zealand with 200 mW.